



## **NASA STTR 2011 Phase I Solicitation**

### **T1.01 Synthetic Biology for Space Exploration**

**Lead Center: ARC**

The field of Synthetic Biology is a rapidly growing area of study that encompasses research ranging from the introduction of incremental function or regulation into existing organisms to the creation of fully synthetic living structures and systems. NASA is interested in harnessing this emerging field to create technological advances for multiple mission focus areas. Topics include biological life support for air, water and waste management; local production of fuels, food and plastics; in situ resource utilization (ISRU) technologies such as biomining for metals and biocementation of regolith for building materials/radiation shielding; biomedical applications including in situ therapeutic production and radiation/gravity countermeasures; advanced chemical and life sensing; and fabrication of advanced materials. Overarching research concerns include using synthetic biology techniques for the development of life forms that have been specifically adapted to perform well in extraterrestrial environments, including increased resistance to radiation, desiccation and temperature extremes. Foundational and applied solutions are sought that provide game-changing capabilities that enable cost effective and sustainable spaceflight and habitation.